REMARKS

Claims 1 and 14 are amended by incorporating the subject matter of claims 6 and 7 and claims 6 and 7 are canceled herein. Additionally, editorial amendments are made to correct various minor informalities. No new matter is presented.

I. Response to Art Rejections

In paragraph 3 of the Office Action, claims 1-6, 9-12, 14-21 and 24-26 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kondo (U. S. Patent 6, 329,061 B2).

In paragraph 4 of the Office Action, claims 1-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kondo (U. S. Patent 6, 329, 061 B2) in view of Kobata et al (U. S. Patent 6,673,456 B1).

Without conceding the merits of the rejections, claims 1 and 14 are amended herein by incorporating the subject matter of claims 6 and 7.

(1) Claims 1 to 13 (dispersions of tin-doped indium oxide (ITO) fine particles)

The present invention aims to provide a dispersion of ITO fine particles which easily adjusts the degree of adhesion due to a combination of dispersion stabilizers, which is excellent in dispersibility of ITO fine particles, which easily suppresses a variation in the degree of adhesion at the interface between a glass and an interlayer film due to a change in moisture of the interlayer film, and which is also less likely to cause solvent shock. The present invention also aims to provide an interlayer film formed by using the dispersion of ITO fine particles, and a heat ray shield laminated glass including the interlayer film (from page 5, line 18 to page 6 line 2 of the present specification).

Here, the term solvent shock means a phenomenon in which the ITO fine particles are converted into agglomerated particles when the dispersion of ITO fine particles is diluted with

a plasticizer for an interlayer film (page 4, lines 9 to 14 of the present specification). Secondary agglomeration of ITO fine particles causes scattering of visible light in a short wavelength range and clouding of the dispersion system is induced under a light source (from page 25, line 25 to page 26, line 8 of the present specification). Therefore, whether the solvent shock is suppressed or not can be evaluated by a reflection yellow index.

In order to attain the above objects, the dispersion of tin-doped indium oxide fine particles of claim 1 has the following features:

(a) the dispersion includes tin-doped indium oxide fine particles, a plasticizer for an interlayer film, an organic solvent containing at least one alcohol as a main component, and dispersion stabilizers;

(b) under measuring conditions of a concentration of the tin-doped indium oxide fine particles of 0.7% by weight and an optical path length of a glass cell of 1 mm, a visible light transmittance is 80% or more;

(c) a solar radiation transmittance at a wavelength within a range from 300 nm to 2100 nm is 3/4 or less of the visible light transmittance;

(d) a haze value is 1.0% or less;

(e) a reflection yellow index is -20 or more; and

(f) the dispersion stabilizers include at least one selected from the group consisting of a sulfate ester-based compound, a phosphate ester-based compound, a ricinoleic acid, a polyricinoleic acid, a polycarboxylic acid, a polyhydric alcohol surfactant, a polyvinyl alcohol, and a polyvinyl butyral, and at least one selected from the group consisting of a chelate, an inorganic acid, and an organic acid.

In accordance with the above features, by including the organic solvent containing at least one alcohol as a main component which has hydrophilic properties, the organic solvent becomes excellent in affinity with the ITO fine particles which have hydrophilic properties, and the compatibility between the plasticizer for an interlayer film and the organic solvent can be enhanced (page 18, lines 17 to 20 of the present specification). Therefore, it is difficult to convert the ITO fine particles into agglomerated particles when the dispersion of ITO fine particles is diluted with a plasticizer, and an effect of preventing solvent shock is exerted. Furthermore, an effect of suppressing a variation in a dispersion property caused by the kind of the plasticizer for an interlayer film is exerted, and various kinds of plasticizers can be used (page 19, lines 5 to 9 of the present specification).

Furthermore, by including the dispersion stabilizers of feature (f), synergistic effects are generated with the above effects, and the effect of preventing agglomeration of ITO fine particles is further enhanced, the solvent shock is prevented, and the reflection yellow index is enhanced (page 19, lines 13 and 14, page 20, lines 18 to 22, and page 21, lines 9 to 13 of the present specification).

That is, by including both of the organic solvent containing at least one alcohol as a main component, and the dispersion stabilizers of feature (f), the solvent shock can be effectively prevented, and as a result, a reflection yellow index of -20 or more (feature (e)) can be realized.

This is proven by the Examples of the specification. In Sample Nos. 1 to 14, volume particle sizes of ITO fine particles in the dispersions are in the range of 38 to 75 nm, and solvent shock is prevented. Therefore, the haze is in a range of 0.4 to 08, which is small, the reflection yellow index is in a range of -7.5 to -18.3, which is large, and the reflection

measured value is in the range of 4.7 to 9.3, which is small. In contrast, in Sample Nos. 17 to 27, the volume particle sizes of ITO fine particles in the dispersions are in the range of 83 to 130 nm, and ITO fine particles are converted into agglomerated particles. Therefore, the haze is in the range of 1.2 to 3.2, which is large, the reflection yellow index is in a range of -22.5 to -32.6, which is small, and the reflection measured value is in the range of 40.5 to 82.2, which is large.

As described above, the Examples prove that by satisfying features (a) and (f), the occurrence of solvent shock is prevented, and features (b) to (e) can be attained.

In contrast, Kondo (US 6,329,061) discloses a laminated glass having an interlayer film in which functional ultra-fine particles are dispersed. However, in Kondo, there is no description or suggestion of dispersion stabilizers. Therefore, feature (f) of the present invention cannot be attained. Furthermore, in Kondo, alcohols are disclosed as solvents for dissolving polyvinyl butyral (PVB) (column 7, lines 50 to 52 of Kondo); however, in the Examples of Kondo, no samples are disclosed in which alcohols are included. Furthermore, in Kondo, alcohols are disclosed as solvents for dissolving polyvinyl butyral (PVB), and there is no description or suggestion of the effects of the present invention in which the solvent shock can be effectively prevented by including both of the organic solvent containing at least one alcohol as a main component and the dispersion stabilizers of feature (f). Therefore, features of the present invention and their effects cannot be obvious over Kondo.

Kobata (US 6,673,456) discloses an intermediate film for laminated glass containing tin-doped indium oxide and/or antimony-doped tin oxide. In Kobata, as dispersants, (a) a chelating agent, (b) a compound with at least one carboxyl group at its terminal position (corresponding to the organic acid), and (c) a modified silicone oil are disclosed (column 9,

lines 1 to 4 of Kobata). Furthermore, as the other dispersants, phosphate compounds, sulfate compounds, polycarboxylate, and poly alcohol surfactants are disclosed (column 11, lines 18 to 23 of Kobata).

In Kobata, it is described that in a dispersion for forming the intermediate film for the laminated glass, organic solvents are used; however, there is no description or suggestion of using at least one alcohol. Since in Kobata, an organic solvent containing at least one alcohol as a main component is not used, the occurrence of solvent shock cannot be prevented sufficiently; thereby, feature (e) of the present invention cannot be attained as shown in the Examples.

Here, with regard to the reflection yellow index of dispersions of ITO fine particles in the Examples of the present specification, values of samples 1a to 14 satisfying features of claim 1 and values of samples 17 to 27 which do not include either alcohol or dispersion stabilizers of feature (f) are shown in the following Table 1.

Table 1

		Alcohol	
		Included	Not Included
Dispersion stabilizers	Included	-7.5 to -18.3	-22.5 to -30.0
	Not included	-26.0 to -26.6	-23.5 to -32.6

As shown in Table 1, in samples 1a to 14, the effect of enhancing the reflection yellow index to -20 or more is attained. In contrast, the effect of enhancing the reflection yellow index to -20 or more is not attained in the case in which either alcohol or dispersion stabilizers of feature (f) is not included.

Inclusion of both of the organic solvent containing at least one alcohol as a main component and the dispersion stabilizers of feature (f) are not disclosed in Kondo and Kobata. Furthermore, in Kondo, alcohols are disclosed as solvents for dissolving polyvinyl butyral (PVB), and there is no description or suggestion of the effects of the present invention in which the solvent shock can be effectively prevented and the reflection yellow index is enhanced.

Therefore, the dispersion of tin-doped indium oxide fine particles of claim 1 is not obvious over the combination of Kondo and Kobata, and is patentable over Kondo and Kobata.

(2) Claims 14 to 17 (methods for manufacturing the dispersion of tin-doped indium oxide fine particles).

As described above, the inclusion of both of the organic solvent containing at least one alcohol as a main component and the dispersion stabilizers of feature (f) is not disclosed in Kondo and Kobata. Furthermore, in the present invention, the occurrence of solvent shock is sufficiently prevented. This effect cannot be attained in Kondo or Kobata. Therefore, the method for manufacturing the dispersion of tin-doped indium oxide fine particles of claim 14 is not obvious over Kondo or Kobata, and is patentable over Kondo and Kobata.

(3) Claims 18 to 23 (interlayer films for heat shield laminated glass)

The interlayer film for heat shield laminated glass of claim 18 has the following features:

(g) it is formed by using a resin composition of a mixture of the dispersion of tin-doped indium oxide fine particles of claim 1 and a resin; and

(h) under measuring conditions in which the interlayer film having a thickness of 0.76 mm is interposed between clear glass sheets having a thickness of 2.5 mm, electromagnetic wave shield properties at a frequency of 0.1 MHz to 26.5 GHz are 10dB or less, a haze value is 1.0% or less, a visible light transmittance is 70% or more, a solar radiation transmittance at a

wavelength within a range from 300 to 2100 rim is 80% or less of the visible light transmittance, and a reflection yellow index is -12 or more.

Since it is formed by using a resin composition of a mixture of the dispersion of tin-doped indium oxide fine particles of claim 1 and a resin (feature (g)), even if the dispersion of ITO fine particles is diluted with a plasticizer, a good dispersion state is maintained. Therefore, the ITO fine particles are fixed in a state of being dispersed uniformly in the interlayer film. That is, as a result of preventing agglomeration of the ITO fine particles by the organic solvent containing at least one alcohol as a main component and the dispersion stabilizers, the ITO fine particles are fixed in the interlayer film without agglomeration. Accordingly, among feature (h), in particular, the reflection yellow index of -12 or more can be attained.

In contrast, since in Kondo, feature (g) is not utilized, the occurrence of solvent shock cannot be prevented, and therefore, the reflection yellow index of -12 or more cannot be attained.

In Kobata, since a dispersion of ITO fine particles including the organic solvent containing at least one alcohol as a main component is not used, the occurrence of solvent shock cannot be prevented. Therefore, the reflection yellow index of -12 or more cannot be attained.

As described above, feature (g) is not disclosed in Kondo or Kobata, and the present invention attains effects which cannot be attained in Kondo or Kobata. Therefore, the interlayer film for heat shield laminated glass of claim 18 is not obvious over Kondo or Kobata, and is patentable over Kondo and Kobata.

(4) Claims 24 to 26 (laminated glasses)

Since the interlayer film for laminated glass of claim 18 is patentable over Kondo and Kobata, the laminated glass of claim 24 is also patentable over Kondo and Kobata.

II. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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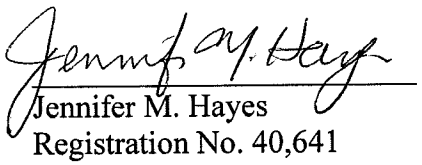
Respectfully submitted,



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